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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,116	04/19/2002	Lutz Fabian	EF377397961US	1556
21003	7590	06/26/2007	EXAMINER	
BAKER BOTTS L.L.P.			DUONG, THANH P	
30 ROCKEFELLER PLAZA				
44TH FLOOR				
NEW YORK, NY 10112-4498				
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			1764	
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			06/26/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/018,116

Applicant(s)

FABIAN ET AL.

Examiner

Tom P. Duong

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Applicants' remarks and amendments filed on April 24, 2007 have been carefully considered. Claims 20 and 39 have been amended. Claims 20-39 are pending in this application.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 20-31 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton '877 in view of Carr et al. (5,011, 520). Regarding claims 20-21 and 39, Barton discloses a waste gas cleaning system for removing harmful and/or toxic gases from a gas stream (Fig. 1), comprising: a reaction chamber (14) for treating and converting harmful and/or toxic gases (Col. 3, lines 1-10), said reaction chamber (14) having an inlet (60) for receiving a gas stream to be treated and an outlet (90); a plasma source (12) coupled to said reaction chamber (14) for providing excitation energy (Col. 3 lines 20-26) to said reaction chamber (14) for treating harmful and/or toxic gases for their removal and/or disposal and form a plasma therein; and a liquid jet pump (94) having a suction tube or port (90) arranged at said reaction chamber outlet (90) and generating sufficient negative pressure (Col. 6, lines 31-37) in

said reaction chamber (14) for generating a plasma therein. With respect to the liquid jet pump, Barton discloses the spray nozzles (94), which contains spray ring 16, which is connected to the reaction vessel outlet port 90, and connected to reservoir 98 of high pressure quench water (Col. 5, lines 15-45). The spray nozzles (94) appear to constitute a liquid jet pump of the claimed invention being the fact that the spray nozzles (94) spray the scrubbing liquid at a high pressure which draws and mixes the gas and scrubbing liquid and thereby, creates a negative pressure in the reaction chamber (Col. 5, lines 15-60). Barton discloses a liquid jet pump but is silent with respect to a liquid jet pump has a "constricted region" having a lower pressure that is connected via said suction tube or port to said reaction chamber to provide a vacuum drawing power or suction on said reaction chamber. Carr teaches that the spray nozzles 86, together with the flow constriction 90 (constricted region), is adjusted to create suction sufficient to draw the gaseous effluent into the main scrubbing chamber 22 and simultaneously intimately to mix the effluent with the scrubbing liquid (Col. 8, lines 28-43 and Figure 5). The inside surface 90 of the structure 84 converges to form a venturi or "constricted region" of the claimed invention. Likewise, Carr also shows another embodiment on Figure 6 where nozzle (91) constitutes a liquid jet pump, has a constricted region (87) to increase the velocity of the scrubbing liquid (Col. 9, lines 1-30). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the apparatus of Barton with a liquid jet pump with a constricted region as taught by Carr in order to promote intermixing between the gas and scrubbing liquid and maintain a negative pressure in the scrubber system. Note, Applicant's original drawing (Figure 1

Art Unit: 1764

and Section 0036) shows a liquid jet pump (3), which is a "constricted" nozzle. There is no clear written description or illustration of the claimed "liquid jet pump" other than Figure 1 shows a liquid jet pump (3) which is a constricted nozzle (best understood by Examiner). Regarding claim 22, the above references fail to disclose the specific negative pressure range of the claimed invention, however, the applied references disclose the features of the claimed invention and it would have been *prima facie* obviousness to optimize the scrubbing system to obtain such negative pressure at most thru routine experimentation. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Regarding claim 23, Barton discloses the liquid jet pump is provided with a sorption medium (110). Regarding claims 24-26 and 37, Barton fails to disclose a recirculation system including said liquid jet for said sorption medium. Carr teaches a recirculation system consisting of a circulation pump 100 and recirculation tank 218 with coolant coils (Col. 13, lines 35-38) and control panel 224 to control the recirculation flow rate (Col. 13, lines 45-52) and a reservoir having neutralized agent (Col. 13, lines 52-54) to prevent build up in the system and further facilitating self-cleaning of the gas in the scrubber (Col. 4, lines 34-41). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the scrubbing system of Barton with a recirculation system as taught by Carr in order to control the build up in the system and facilitating self-cleaning of the gas scrubber. Regarding claim 27, it is conventional to provide a circulation pump with a compressed air-driven diaphragm pump in the scrubbing system and it would have been obvious to do so here due to its low maintenance and reliability. Regarding claim 28, Barton discloses a secondary air inlet

Art Unit: 1764

(via line 44), which appears to contribute to the negative pressure in the reaction chamber. Regarding claim 29, Barton discloses an additional gas (via line 70) to the reaction burner 12 to facilitate the combustion process. Regarding claims 30-31, it is conventional to provide additional gas such as hydrogen, oxygen, and water vapor the reaction chamber and it would have been obvious to do so here to facilitate the oxidation and/or decomposition process. Regarding claim 36, Barton discloses the output of the pump 112 is control by a pH sensor and control is connected to the metering pump to provide alkaline material to the quench water (Col. 5, lines 46-63). Regarding claim 38, Barton discloses the suction line includes at least one aerosol filter (24).

2. Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applied references (Barton '877 in view of Carr et al. '520) and further in view of Wofford et al. (5,750,823). The applied references disclose the plasma source but is silent with respect to a non-thermal plasma source with excitation energy in the microwave range of the claimed invention. Wofford teaches the waste gas is exposed in a non-thermal plasma (Abstract) with microwave energy (Col. 3, lines 5-10) having the microwave range (Col. 5, lines 1-10) of the claimed invention and the use of a non-thermal plasma provide the advantages of reduced energy consumption and more easily removed by-products (Col. 1, lines 4-67 and Col. 2 lines 1-15). Thus, it would have been obvious in view of Wofford to one having ordinary skill in the art to modify the

apparatus of the applied references with a non-thermal plasma source as taught by Wofford in order to gain the above advantages.

### ***Response to Arguments***

Applicants' arguments filed December 18, 2006 have been fully considered but they are not persuasive. Applicants argue the applied references above fail to disclose or suggest a liquid jet pump of the instant claim. Examiner respectfully disagrees. The above combination of Barton and Carr discloses the features of the claimed invention. Examiner's comment with respect to the "liquid jet pump" in the previous office action dated on 2/7/07 continues to apply here.

Note, Applicants' original drawing (Figure 1 and Section 0036) shows a liquid jet pump (3), which is a "constricted" nozzle. There is no clear written description or illustration of the claimed "liquid jet pump" other than Figure 1 shows a liquid jet pump (3) which is a constricted nozzle (best understood by Examiner). Examiner agrees the liquid jet pump (3) or constricted nozzle (3) creates a "Venturi Effect" for liquid jet as urged by Applicants and the applied references above describe the claimed liquid jet pump or constricted nozzle as claimed.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM (IFP).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Glenn Caldarola  
Supervisory Patent Examiner  
Technology Center 1700



Art Unit: 1764

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Duong  
June 11, 2007

*T.D*